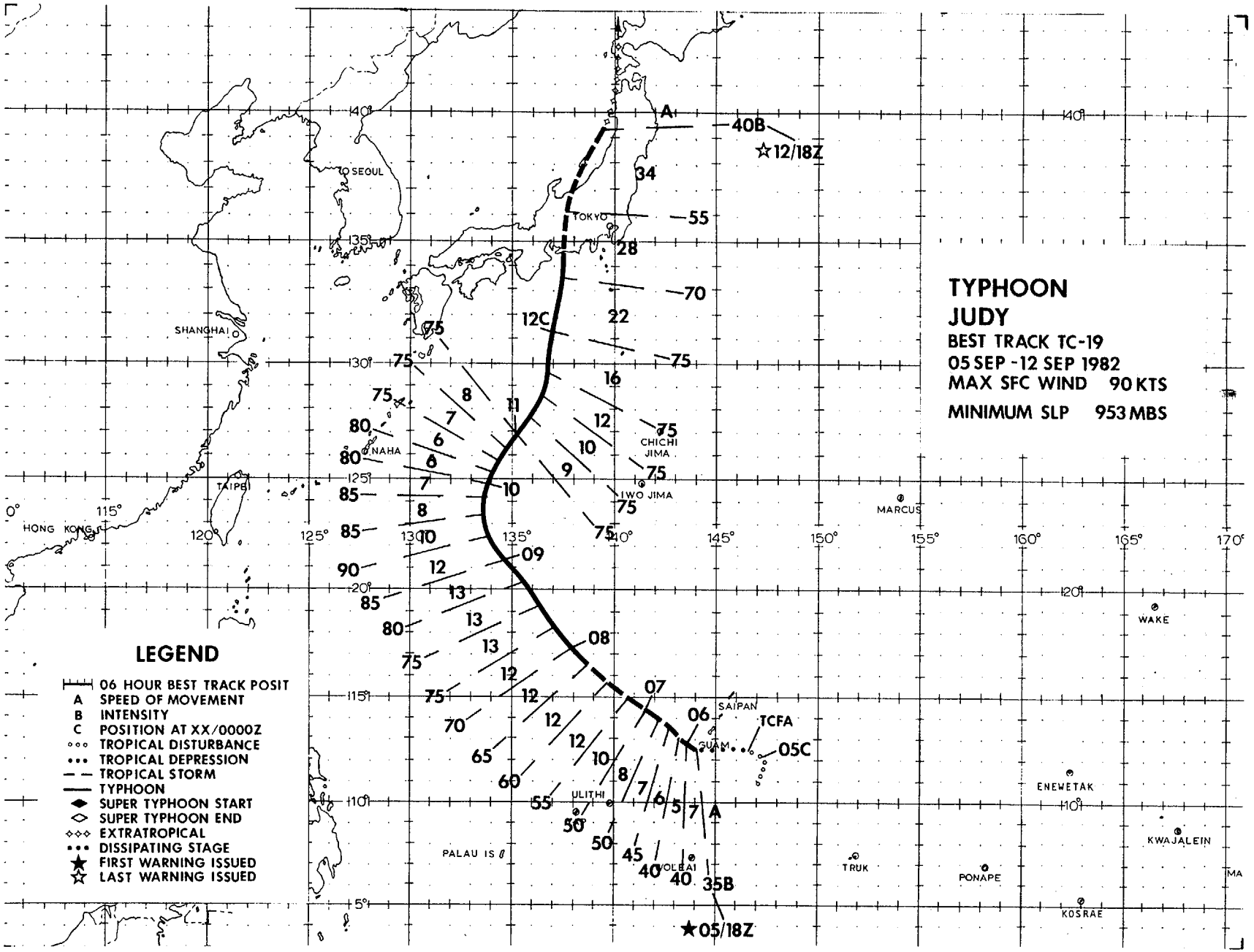
TYPHOON
JUDY
BEST TRACK TC-19
05 SEP - 12 SEP 1982
MAX SFC WIND 90 KTS
MINIMUM SLP 953 MBS
LEGEND
06 HOUR BEST TRACK POSIT
A SPEED OF MOVEMENT
B INTENSITY
C POSITION AT XX/0000Z
TROPICAL DISTURBANCE
TROPICAL DEPRESSION
TROPICAL STORM
TYPHOON
SUPER TYPHOON START
SUPER TYPHOON END
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED
LAST WARNING ISSUED
SEOUL
TOKYO
SHANGHAI
NAHA
TAIPEI
HONG KONG
CHICHI JIMA
IWO JIMA
MARCUS
SAIPAN
GUAM
TCFA
05C
ULITHI
PALAU IS
WOLEAI
TRUK
PONAPE
KOSRAE
ENEWETAK
WAKE
KWAJALEIN
40B
12/18Z
35B
05/18Z

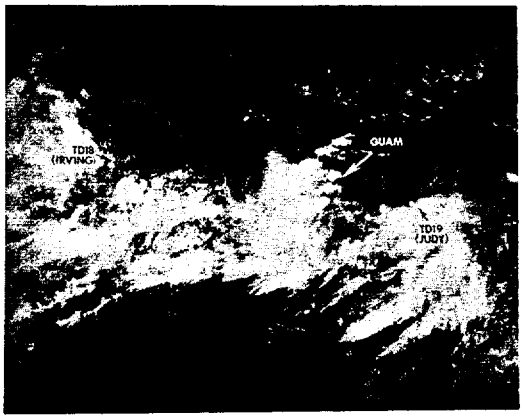

Figure 3-19-1. 050520Z September (NOAA 7 visual imagery).

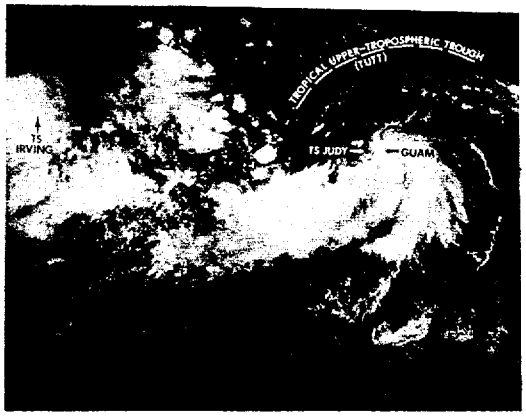

Figure 3-19-2. 060508Z September (NOAA 7 visual imagery).

Typhoon Judy, along with Typhoon Irving (18) developed within a very active monsoon trough that dominated the low-latitudes of the western North Pacific during the first week of September. At 041200Z, synoptic data indicated low-level winds were beginning to organize around the disturbances which later became Judy and Irving. This apparent organization prompted the reissuance of the Significant Tropical Weather Advisory (ABEH PGTW) at 041600Z which discussed each of these systems for the first time. The relatively continuous maximum cloud zone that spawned these two typhoons is shown in Figure 3-19-1, at about the time that a Tropical Cyclone Formation Alert was issued for Judy and the initial warning was issued for Tropical Depression 18 (Irving).

During the ensuing 24-hour period, Judy rapidly organized while Irving slowly intensified. It was during this period that satellite imagery showed the maximum cloud zone segmenting around the two systems (Figure 3-19-2). The first warning for Tropical Depression 19 was issued at 051600Z when satellite imagery indicated a progressive development of cloud features around the system. The first reconnaissance aircraft mission for Judy was conducted at 052239Z and reported 45 kt (23 m/sec) surface winds and a 994 mb minimum sea level pressure. Based on these data, Tropical Depression 19 was upgraded to Tropical Storm Judy on the 060000Z warning.

Initial forecasts for Judy anticipated a movement toward the west-northwest as the numerical forecast series built the subtropical ridge from 150E toward 130E along 25N. However, the subtropical ridge did not build from east to west but built northward along 150E instead. This change in ridge orientation, along with the eastward progression of a short wave trough over Asia, permitted Judy to track northwestward toward eventual recurvature east of Okinawa.

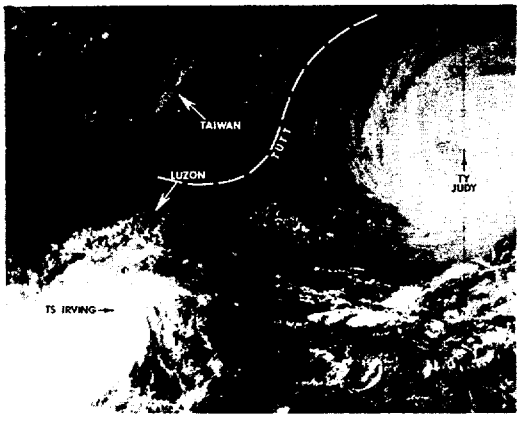

Figure 3-19-3. 090613Z September (NOAA 7 visual imagery).

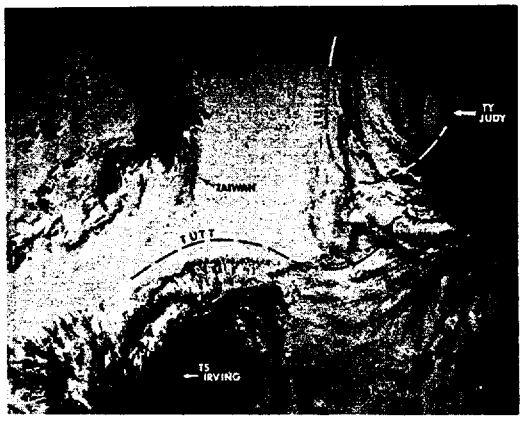

Figure 3-19-4. 091858Z September (NOAA 7 infrared imagery).

From 6 to 9 September, Judy developed at a fairly steady rate (15 to 20 kt (8 to 10 m/sec) per day) and reached a peak intensity of 90 kt (46 m/sec) on 9 September. This period of intensification was aided by a tropical upper-tropospheric trough (TUTT) that was located to the north and northwest of Judy through most of this period.

On 8 and 9 September, 200 mb data and satellite imageries suggested that Judy's upper-level circulation was moving into a region previously occupied by the TUTT. As depicted in Figure 3-19-3, the TUTT axis was contorted northward around the periphery of the advancing Judy. By 091858Z (Figure 3-19-4), satellite imagery revealed that the west quadrant was virtually devoid of deep-layer convection and Judy's center had expanded to more than 90 nm (167 km) in diameter. During this period, Judy exhibited a reversal in sea level pressure tendency and subsequent reintensification was not observed. Based on the interpretation of available data, it appears that at the mid- and upper-tropospheric levels, Judy may have ingested the remnants of the TUTT; and this entrainment of cooler air at these levels may have accounted for the changes in Judy's intensity trend and the resultant satellite signature that were observed on 9 September.

Prior to 081800Z, JTWC forecast tracks predicted that Judy would progress slowly toward the north in the 48- to 72-hour period with a close approach to Okinawa expected. However, with the issuance of warning number 13 at 081800Z, a significant change toward the north and recurvature toward eastern Honshu was forecast. This change in the forecast was prompted by the 081200Z 500 mb and 200 mb analyses data which showed a deeper penetration of a mid-latitude trough, south of Korea, than was previously anticipated.

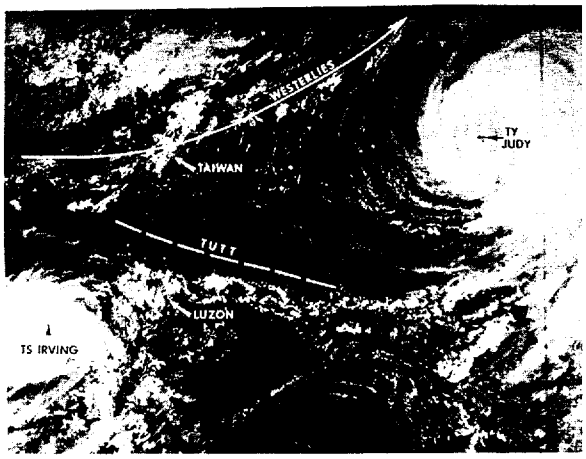

Figure 3-19-5. 100601Z September (NOAA 7 visual imagery)

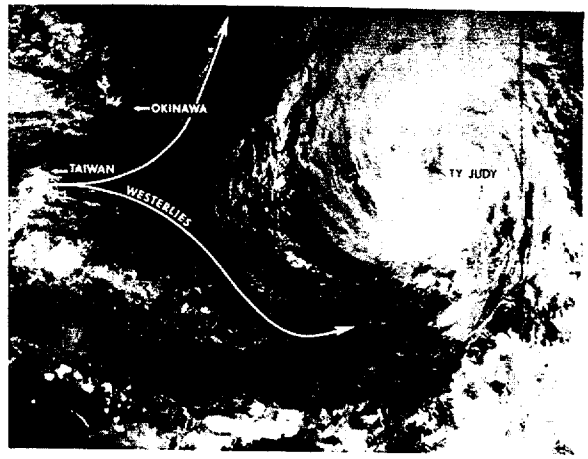

Figure 3-19-6. 110549Z September (NOAA 7 visual imagery)

On 10 September, Judy was moving slowly (6 to 7 kt (11 to 13 km/hr)) toward the north-northeast; satellite imagery (Figure 3-19-5) shows the cloud signature returning to a more circular appearance. Presumably, the interaction with the TUTT had ceased and the mid- and upper-levels were returning to a more typical environment for a mature typhoon.

Judy accelerated toward Japan on the 11th; this movement had been expected as early as 9 September (near 24N) but was delayed until the influence of low-level steering became favorable for a sustained northward movement. A low-level anti-cyclone, centered near 45N 120E, had been exerting a relatively strong north to northeast flow over the Sea of Japan southward to 27N. On 11 September, this anticyclone began to weaken and its influence on the region north of Judy abated. In response, Judy accelerated from 8 kt (15 km/hr) at 110000Z to well over 25 kt (46 km/hr) before it struck Japan 38 hours later. Figure 3-19-6 shows Judy as this acceleration began.

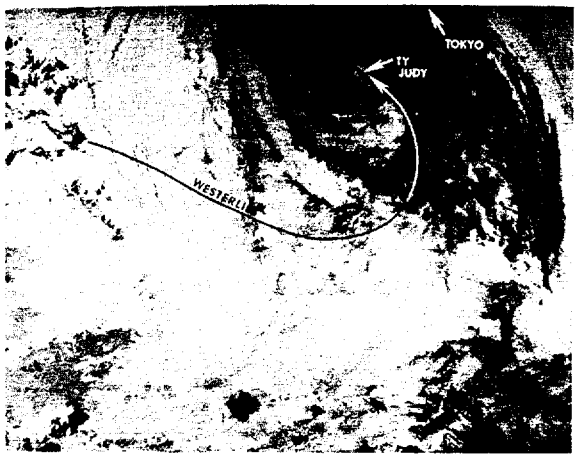

Figure 3-19-7. 111834Z September (NOAA 7 infrared imagery)

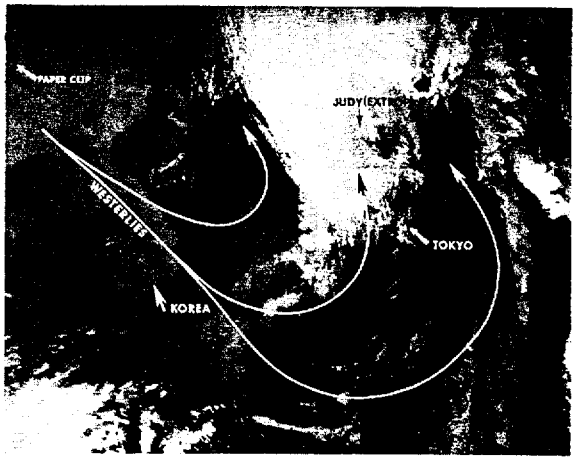

Figure 3-19-8. 121810Z September (NOAA 7 infrared imagery).

As Judy approached 30N, strong upper-level winds from the south-southwest began exerting considerable pressure on Judy. As seen in Figure 3-19-7, convective activity was eroding on the southwestern periphery of Judy's center. This process preceded and accompanied Judy through its extratropical transition (Figure 3-19-8).

At 120800Z, Judy made landfall upon Omaezaki Point in Shizuoka Prefecture, southeast of Nagoya. Judy moved rapidly over the mountainous region of central Honshu and entered the eastern portion of the Sea of Japan where extratropical transition followed. In its wake, Judy left at least 25 dead and the accompanying torrential rains and floods damaged more than 61,000 houses, washed out sections of 956 highways and swept away 46 bridges in an area stretching from Osaka in the south, to Hokkaido in the north.